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WAGNER'S HYPOTHESIS: A LOCAL PERSPECTIVE

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Abstract

Wagner's hypothesis of an expanding public sector as an economy develops is tested using pooled time-series cross-sectional data for U.S. states from 1964 to 1986. Comparing government size among fiscal jurisdictions within a single nation reduces the problems of data comparability and of controlling for cultural and institutional differences that plague the more common international tests of this theory. Our results are inconsistent with Wagner's hypothesis, yielding a negative relationship between public-sector size and output. However, some empirical support is found in the protective services and public welfare components of government activity.

I. Introduction

Adolph Wagner's simple hypothesis that the relative size of the public sector increases concomitant with industrialization has spawned a century of significant research activity. In a plethora of empirical studies, researchers have sought empirical validation of the Wagnerian hypothesis, which is often elevated to the position of Wagner's Law.[1] The typical study estimates the correlation between the share of government expenditures in Gross Domestic Product (GDP) and income per capita. A significant positive correlation provides confirmation of Wagner's hypothesis.

Most of the empirical efforts that focus on testing Wagner's theory concentrate on intercountry cross-section comparisons. These comparisons are plagued with shortcomings, however. In addition to the obvious problem of comparability of data, particularly between advanced and developing countries, cultural and institutional differences also complicate the analysis. These concerns suggest that comparisons based solely on the ratio of government expenditures to national income are seriously incomplete and obviously biased due to the lack of other controls. Although recent studies, such as Ram (1987), have attempted to use more comparable data, the issue of cultural and institutional differences remains unresolved.

Using cross-sectional analysis to test Wagner's hypothesis results in other problems as well. Richard Bird (1971) has argued forcefully, based on his translation and interpretation of Wagner's writing, that Wagner's Law was forwarded as a development hypothesis. According to Bird, Wagner's assertion was intended to apply to a *single* developing economy over time, not to

variations in relative public-sector spending across different economies at a given point in time. In their present form, cross-sectional analyses assume that countries with different per capita GDP are at different stages in their economic development. Ram's careful study provides both time-series and cross-sectional evidence of the working of Wagner's Law for a large international data set. Differences in the implications of these estimates, with stronger support for the Wagnerian edict emerging from the time-series results, highlight the relevance of Bird's observation.

Critical reflection on the concerns and controversies in the existing literature on Wagner's Law suggests that a valuable alternative experiment would be to compare government size among fiscal jurisdictions within a single nation. Such a study would reduce the problems of data comparability and of controlling for cultural and institutional differences. Consistent time-series and cross-sectional data within a single country could be combined to identify both general trends in the relationship between government size and economic development, and variations around those trends among subnational jurisdictions, which are differentiated with respect to development. Although many cross-sectional studies of public expenditure determinants flirt peripherally with this type of test, we are aware of only one (Wallis and Oates [1988]) that directly tests Wagner's hypothesis at the subnational level within a pooled cross-sectional time-series framework. Peltzman (1980), in an interesting study of the effects of interest groups and income distribution on government size, provides an indirect test of Wagner's hypothesis using state-level data.

The purpose of our paper is to examine the relationship between the size of each state's public sector (state and local government) and the level of its economic development by utilizing annual time-series and cross-sectional data from 1964 to 1986. The theme of our analysis matches that of Wallis and Oates, but we offer several variations. This study utilizes estimates of Gross State Product (GSP) rather than of state personal income to measure private economic activity. GSP is more comprehensive than personal income because it includes capital consumption allowances and indirect business charges. The use of GSP is more comparable to the international studies that employ GDP. In addition, we consider other industrialization measures as proxies for economic development, such as the percentage of GSP originating from the resource, manufacturing, and service sectors. We also disaggregate public-sector expenditures into subcategories in an attempt to isolate differential responses within the government sector to increases in development. These disaggregate data allow us to test Wagner's subhypotheses about the public service categories that would expand significantly with economic development.

The remainder of the paper is organized as follows: Section II provides a brief overview of the pattern of economic development across states. In section III, we discuss in detail the data used in this study. Section IV presents the estimation results. Both pooled and separate time-series and cross-section results are discussed. Conclusions are reported in section V.

II. Economic Development

While the United States is a highly advanced economy, the nation is marked by areas with persistently high and low per capita income. The low-income regions include the Southeast, Southwest, Plains, and Rocky Mountain states -- areas generally associated with resource extraction and farming. The high-income regions include the Mideast, Far West, New England, and Great Lakes states, where manufacturing and financial services predominate. Although per capita income has tended to converge over time, these regional distinctions remain. In low-income areas, per capita income was only 64 percent of the national average in 1929, but by 1988, this figure had climbed to 88 percent. By contrast, high-income regions saw per capita income fall from 27 percent to 9 percent of the U.S. average over the same period.

The same pattern of convergence is observed in the broader measure of economic activity, GSP, which consists of personal income (principally labor compensation), indirect business taxes, proprietor's income, and capital charges. For instance, in 1964, GSP per capita in the Midwest was 10 percent higher than the national average. By 1986, this gap had disappeared.

III. Data Description

In order to estimate the relationship between public-sector size and economic development, we use GSP originating from private industries as our measure of private-sector activity, and direct general expenditures by state and local governments within each state as our measure of public-sector size.

GSP estimates are obtained from the Bureau of Economic Analysis (BEA) for the years 1963 to 1986. State and local governments' direct general expenditures are taken from the Census Bureau's decennial surveys and annual Government Finances. Direct general expenditures include all spending other than intergovernmental outlays. We use expenditures instead of own-source revenue because we interpret Wagner, as do others, to be addressing the relationship between economic development and the demand for government services, not the ability of a government to extract resources from the private sector.

Direct government expenditures, obtained for the years 1964 to 1986, include payments to employees, suppliers, contractors, beneficiaries, and other final recipients of government payment. Consequently, state and local government expenditures reported by the Census Bureau differ from the income originating from state and local governments as contained in the BEA's GSP estimates. The BEA includes only labor compensation, while the Census Bureau reports labor compensation *plus* government transfers to individuals, expenditures on supplies and services, and capital outlays. The BEA's estimates are roughly half the size of the Census figures.

Since the size of the state and local public sector relative to the private sector is at issue here, GSP and public expenditures are reported in constant 1982 dollars. The BEA deflates GSP by using separate implicit price deflators for each state. It also estimates a price deflator for the state and local government sector of GSP, but this deflator appears to be the same for every state. Hence, we convert each state's government expenditures into constant dollars using the same national deflator.

In addition to considering the ratio of total state and local government direct general expenditures to GSP, we also look at various components of state and local government spending. These include capital outlays, education, protective services (fire and police), and public welfare (cash assistance payments, vendor payments, and other social service expenditures). As reported in Bird (1971, p. 2), Wagner predicted that the increased demand for protective services accompanying urbanization, coupled with the heightened demand for cultural and welfare expenditures (education and income redistribution) accompanying income growth, would fuel the relative expansion of government activity.[2]

GSP is also broken out into its major sectors: agriculture and forestry; mining; construction; manufacturing; transportation, communication, and public utilities (TCPU); finance, insurance, and real estate (FIRE); and services. The composition of a state's GSP is used to proxy its level of development. For instance, a state with a high proportion of income generated from agriculture, forestry, and mining is considered to be less developed than one with a high proportion of income originating from services and FIRE.

Cross-Section Statistics

Table 1 displays sample statistics for the various measures of private and public activity. These estimates represent the means and variances across states, with state-level estimates averaged over the 1964-1986 period. State and local government's share of GSP ranges from 10 percent for Texas to 22.4 percent for Alaska, with an average share of 15.8 percent. Figure 1

illustrates the regional distribution of public-sector size. States with the largest public sector appear to be concentrated in the Northeast and to some extent in the Pacific region. States with the smallest public sector are found in the east south central portion of the country up through the Midwest.

As reported in table 1, the largest component of state and local government expenditures goes toward education, with an average of 6.2 percent of GSP. Capital outlays account for 3.4 percent of GSP, while protective services and public welfare make up 0.7 percent and 1.6 percent, respectively. The maximum share is at least twice as large as the minimum share. This range is relatively broad considering that, unlike cross-section samples of countries, which encompass an extensive range of economic systems, the sample of states falls within a private market system, and state and local governments have similar constitutions (or charters) and functions.

Table 2 ranks the states by their ratio of selected components of public-sector expenditures to GSP, and table 3 lists the values of these shares. The ranking shows considerable variation across expenditure categories within states. For instance, while Alaska ranks first in total government share, it ranks forty-fifth in public welfare. Rhode Island, on the other hand, ranks first in public welfare but thirty-eighth in capital outlays. Moreover, the ranking of many states runs counter to Wagner's perspective. North Dakota, with 18 percent of its GSP originating from agriculture (see table 4), could be seen as relatively less developed, yet it ranks first in the nation in the percentage of GSP devoted to education -- a function associated with a more advanced stage of development. Ohio, one of the most industrialized and thus

most developed states, ranks forty-third in education's share of GSP.

Time-Series Statistics

As Bird emphasizes, Wagner's Law describes the *process* of economic development; consequently, it is more appropriately represented by time-series data than by cross-sectional analysis. Unfortunately, consistent annual series of state and local government expenditures and GSP are not long enough to encompass sufficient stages of economic development for each state to provide an unbiased test of Wagner's Law. Thus, the 23-year period covered here could be viewed more as a means of smoothing cyclical variation in the shares for each state than as a reflection of the evolution of a state's economy.

However, having said this, it is interesting to recognize that within this relatively short period, there is evidence that GSP per capita and state and local government's share of GSP converge over time. Convergence of GSP per capita to the national average has already been described in section II.

State and local government's share of GSP has also converged during the last three decades. For example, the Midwest's share grew from 15 percent below the national average in the 1960s to about par with the nation by the mid-1980s. Even with the Pacific region's phenomenal economic growth, its public sector has trended downward toward the national average (although it is still 40 percent higher than the nation). By contrast, states in the east south central portion of the country, which traditionally have had relatively small public sectors, have shown modest increases in recent years, climbing

from 30 percent below the national average throughout the 1970s to about 10 percent below in 1986.

The average annual changes in public-sector size reflect, then, the general tendency toward convergence. Those states that start out with large public sectors exhibit slow or negative growth in government's share of GSP throughout the sample period. As shown in table 5, Alaska, which has the largest state and local public sectors, showed one of the fastest declines in state and local government's share of GSP. Louisiana, on the other hand, started out the period second from the bottom in its public-sector share of GSP, but registered the highest percentage growth in public-sector size throughout the period.

Louisiana is joined by 15 other states posting gains in the relative size of their public sectors. Five of these are located in the Midwest, four are in the Rocky Mountain region, three are in the South, and four are on the East Coast. With respect to the components of public expenditures, the ratio of public outlays to GSP fell in every state but Wyoming. Education expenditures per GSP also declined in three-fourths of the states. Protective services, on the other hand, claimed an increasing share of GSP in three-fourths of the states, and public welfare per GSP rose everywhere except Alaska and New Hampshire.

IV. Estimation Results

Our basic approach to investigating the relationship between economic development and public-sector size is similar to that of Wallis and Oates (1988). We use a panel data set of 50 states observed annually between 1964 and 1986 to estimate a simple model in which state and local expenditures per GSP are a function of both per capita GSP and the percentage of GSP originating in each major sector. Following Wallis and Oates, we also include the age of the state, as measured by the length of time since it achieved statehood. As an extension of their work, we estimate this relationship for total state and local government spending, as well as for each of its major components.

Like Wallis and Oates, we recognize that every state possesses specific characteristics resulting from unique historical events or specific functions not captured by the continuous explanatory variables included in the regression. Similarly, national shocks that affect a state's output or spending patterns may not be reflected in the variables included in the model.[3] State-specific and time-specific dummy variables are incorporated in the regression to account for these effects.

The estimation results are shown in table 6. In all cases, per capita GSP is negatively related to public-sector size, and the estimates are statistically significant at the 1 percent level. These negative coefficients are in contrast to the statistically insignificant results reported for most coefficients by Wallis and Oates. The models differ, however. Wallis and Oates include several variables to proxy for development that are different

from our GSP composition variables. In addition, we use GSP as the basis for measuring income and public-sector size, whereas Wallis and Oates use personal income. Even when we include Wallis and Oates' measure of a state's age, the coefficient on per capita GSP remains negative and statistically significant.

Another possible confounding issue is the possibility that the coefficients on per capita GSP differ across states. The state dummy variables control for state-specific effects that may determine the size of the public sector, but these fixed effects do not take into account the possibility of varying parameters. Interacting the state dummy variables with per capita GSP tests for this possibility. In all cases, the joint hypothesis that the interaction terms are not statistically significant is rejected. The next subsection considers estimating regressions separately for each state.

It is interesting to examine the time-dummy coefficients. Conceptually, the time-specific variables reflect the shift in the schedule within the two-dimensional space having public-sector size on the vertical axis and per capita GSP on the horizontal. The negative coefficient on per capita GSP dictates that the function in this space slopes downward. However, according to the time-specific estimates, for any given level of per capita GSP, the curve shifts outward and to the right for total expenditures as time progresses. Thus, the size of the public sector increases over time for a "typical" state with a given per capita GSP (figure 2). This outward drift suggests that other variables not included in the regression could perhaps explain the expanding public sector. The strongest upward trends are found

for protective services and public welfare, as Wagner predicted (figures 3 and 4). However, not all government functions exhibit expansion over time in their share of GSP. The time-specific coefficients in the public capital outlay regression show a distinct decline in share of GSP (figure 5), while education shows only a slight upward trend (figure 6).

Time-Series Estimates

The magnitude and even the sign of the coefficient on per capita GSP, as well as on other variables, may vary across states. Thus, because of the drastic reduction in degrees of freedom, each state is regressed separately using a slightly modified model. The GSP composition is combined into two sectors instead of the six used previously to preserve degrees of freedom. Agriculture, forestry, and mining are combined into one group called "primary sectors," and manufacturing is included to represent the industrialized sectors. Each regression is estimated using generalized least squares to correct for first-order autocorrelation. As shown in table 7, the number of significant coefficients on per capita GSP varies by government budget category, and except for protective services and public welfare, the coefficients are almost always negative. For total expenditure shares, 28 of the 50 states exhibit statistically significant coefficients on per capita GSP, of which only three are positive (Wisconsin, Ohio, and Nebraska). For public outlays, 37 states yield statistically significant coefficients, and all are negative. Education has 26 statistically significant coefficients, with one (Rhode Island) positive. A sizable number of the statistically

significant coefficients for the last two categories, protective services and public welfare, are positive (eight of 22 and 15 of 20, respectively).

The positive relationship between per capita GSP and the size of protective services and public welfare relative to GSP, juxtapositioned with the negative relationship for the other two categories, supports the spirit of Wagner's Law in two respects. First, Wagner foresaw that externalities caused by increased congestion would engender a greater need for protective services and public welfare. Second, many of the states with positive coefficients on per capita GSP, particularly for public welfare, are the more industrialized ones. These include Indiana, Massachusetts, Michigan, Ohio, Rhode Island, and Wisconsin.

Cross-Section Estimates

Cross-section estimates were obtained for each of the 23 years covered in this study by regressing public-sector size against per capita GSP, state age, population density, primary-sector share of GSP, and manufacturing-sector share of GSP. The results, shown in table 8, are generally consistent with the time-series estimates. The coefficient on per capita GSP in the total expenditure equation is negative whenever it is statistically significant, which is half the time. The coefficient on per capita GSP in the education regression is also negative whenever it is statistically significant, which occurs for all but four years. For protective services, 14 coefficients are statistically significant, and all are positive.

The two anomalies are public capital outlays and public welfare. Only

one of the public capital outlay coefficients is statistically significant, which is somewhat surprising, since more states have statistically significant and negative income coefficients for this category than for any other. On the other hand, the coefficient in the pooled estimates is the least statistically significant of the group. Public welfare also has very few statistically significant income coefficients in the time-series estimates, which is puzzling in light of the strong negative relationship found in both the pooled and the time-series estimates. The negative coefficient is also curious, since the other two methodologies yield positive coefficients.

V. Conclusion

This study assembles new evidence regarding the validity of Wagner's Law at the subnational level. We find a negative and significant relationship between per capita GSP and the ratio of aggregate state and local expenditures to GSP -- evidence that refutes Wagner's hypothesis. We do find some empirical support, however, for Wagner's subhypothesis that the protective services and public welfare components of government activity will be primary sources of public-sector expansion.

Two final observations are in order. First, the upward drift in government's share of per capita GSP over time requires further investigation. In particular, hypotheses about the impact of increased interest group activity or changes in intergovernmental grant activity upon the estimated share-development relationship during the period examined here could be explored. Second, in fairness to Wagner, his hypothesis was intended to apply

to a country making the transition from an underdeveloped to a developed economy, while the U.S. experience over the past three decades has been one of continuing development of regional economies within a mature national economy.

Footnotes

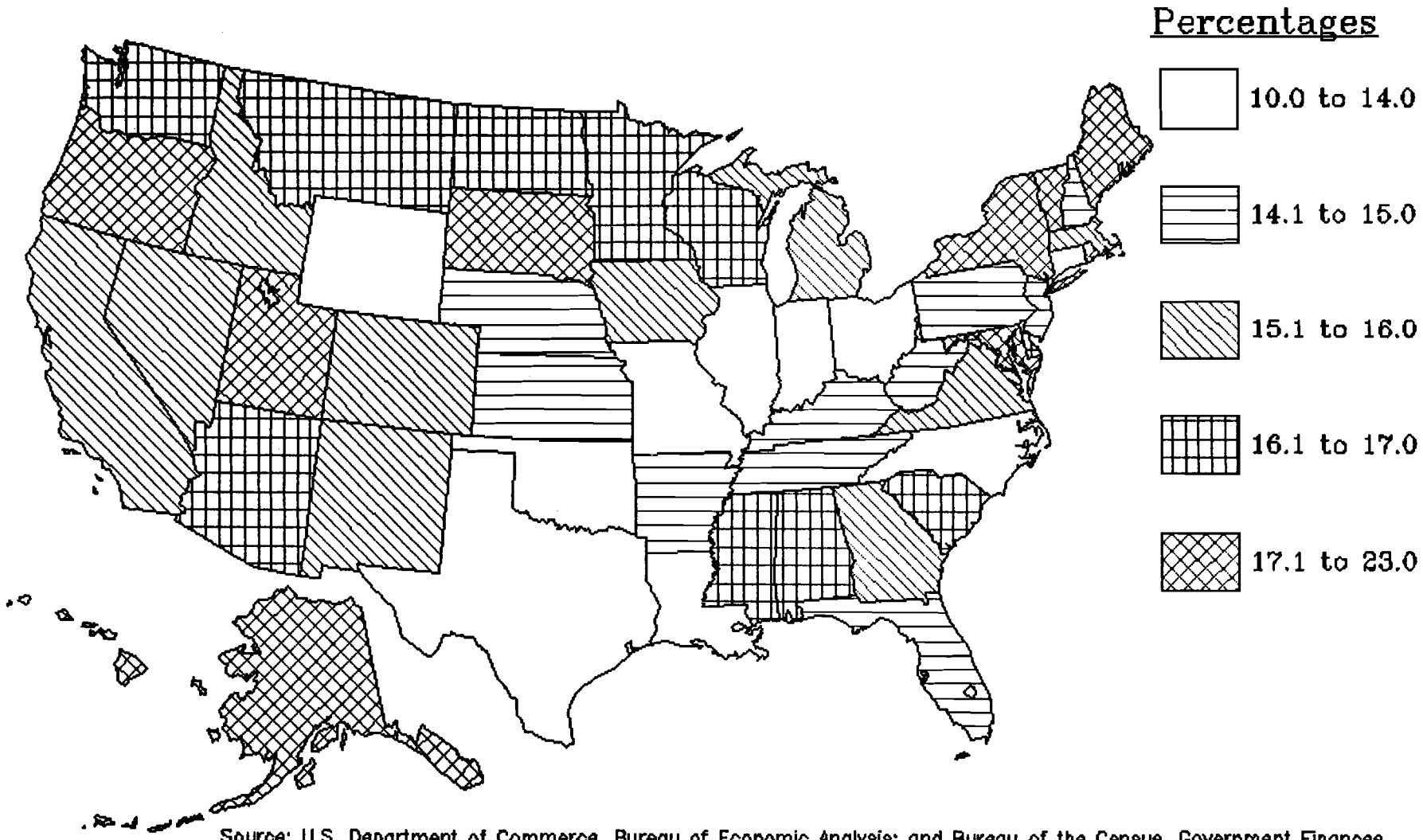
[1] For a review of the studies conducted through 1980, see Bennet and Johnson (1980).

[2] Education and public welfare receive significant funds from the federal government. Categorical cash assistance payments to state governments are received mainly in the form of Aid to Families with Dependent Children. All states participate in this program, but their matching requirements have varied from one-fifth to one-half in recent years. Although typically financed by debt issuance, public outlay expenditures exclude interest payments on debt.

[3] Shocks can affect state and local expenditures through two linkages. Revenues are tied to GSP, and according to Holtz-Eakin, Newey, and Rosen (1987), past revenues help to predict current expenditures.

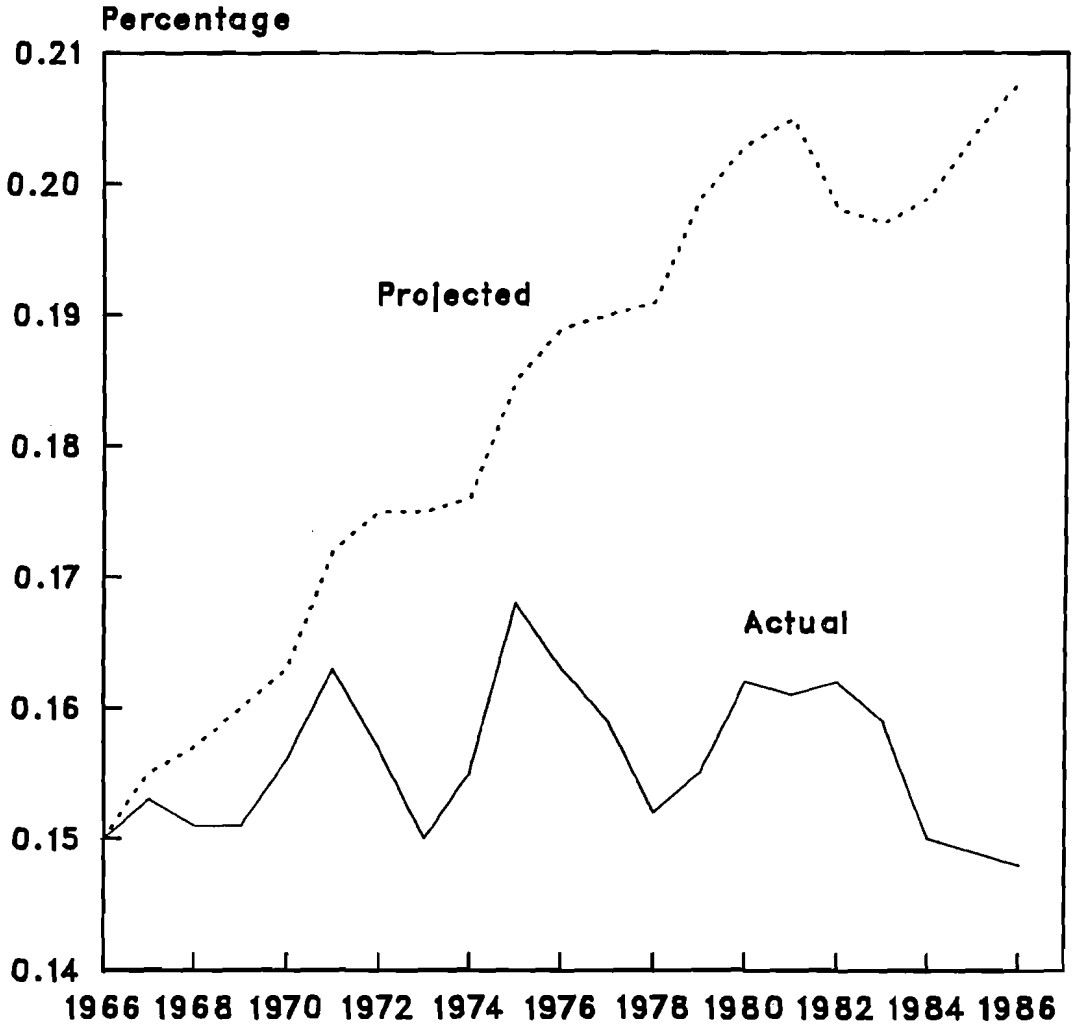
Figure 1: State and Local Government Share of GSP

1964–1986



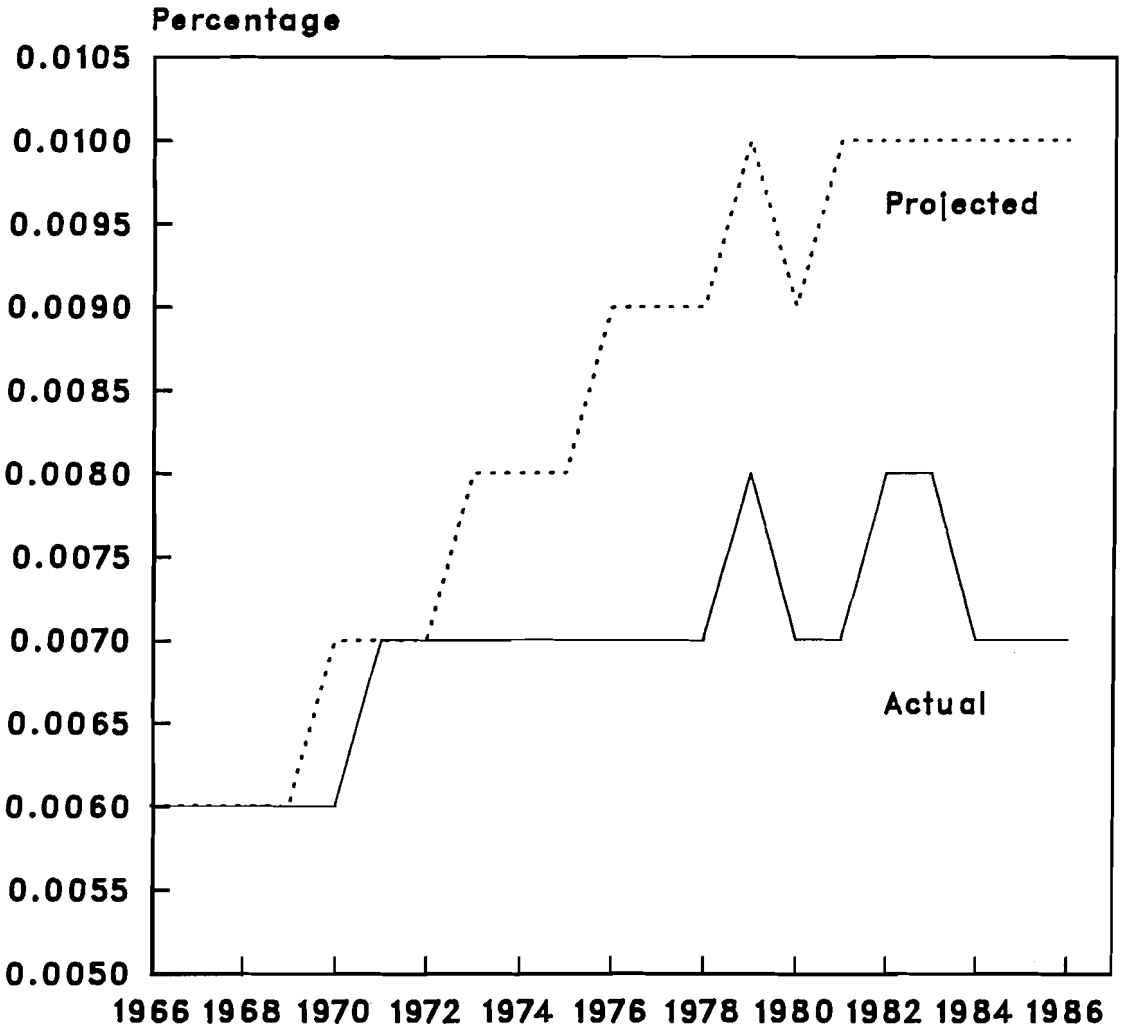
Source: U.S. Department of Commerce, Bureau of Economic Analysis; and Bureau of the Census, Government Finances.

Figure 2: Actual and Simulated Values for Total State and Local Government Expenditures as a Share of GSP



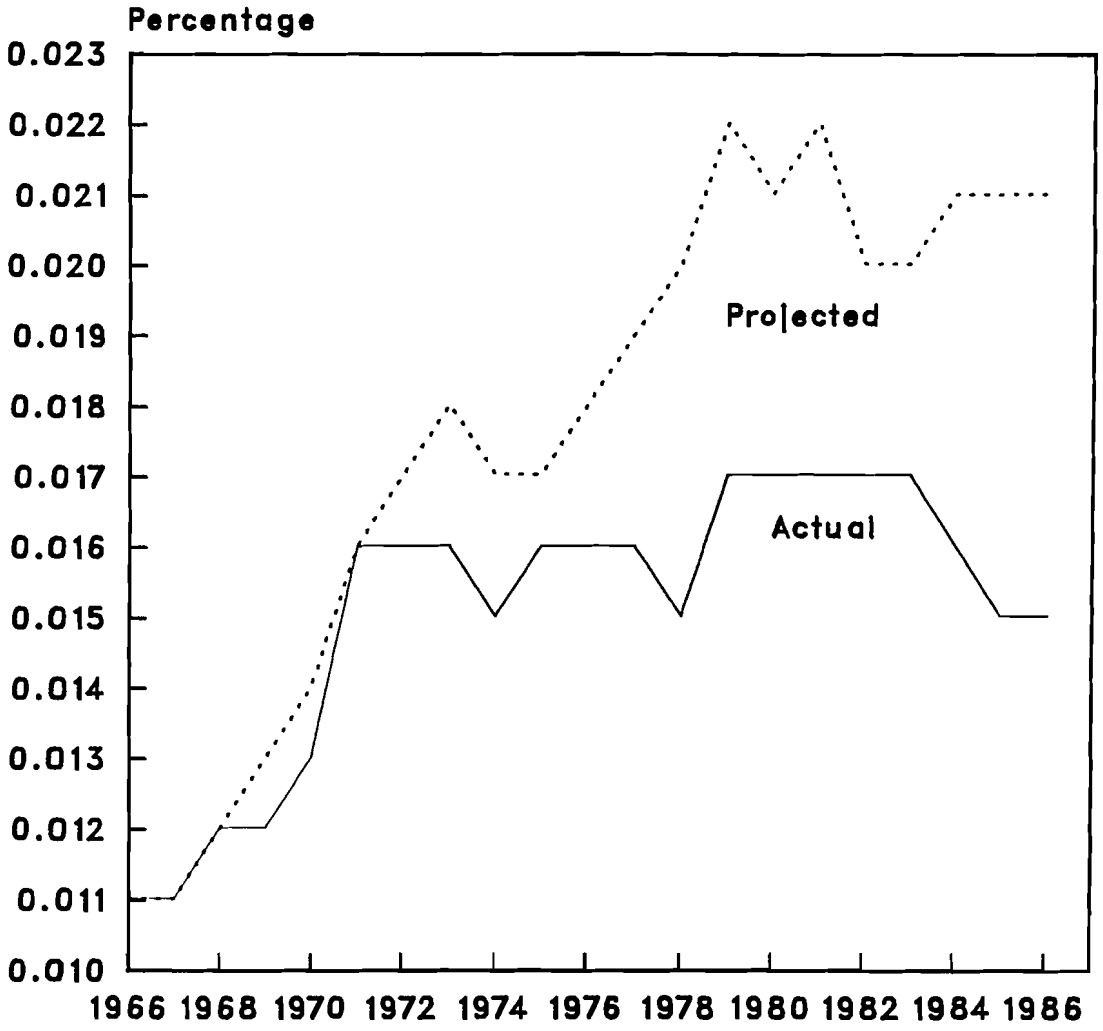
Source: U.S. Department of Commerce, Bureau of Economic Analysis; and Bureau of the Census, Government Finances.

Figure 3: Actual and Simulated Values for Total State and Local Protective Services Expenditures as a Share of GSP



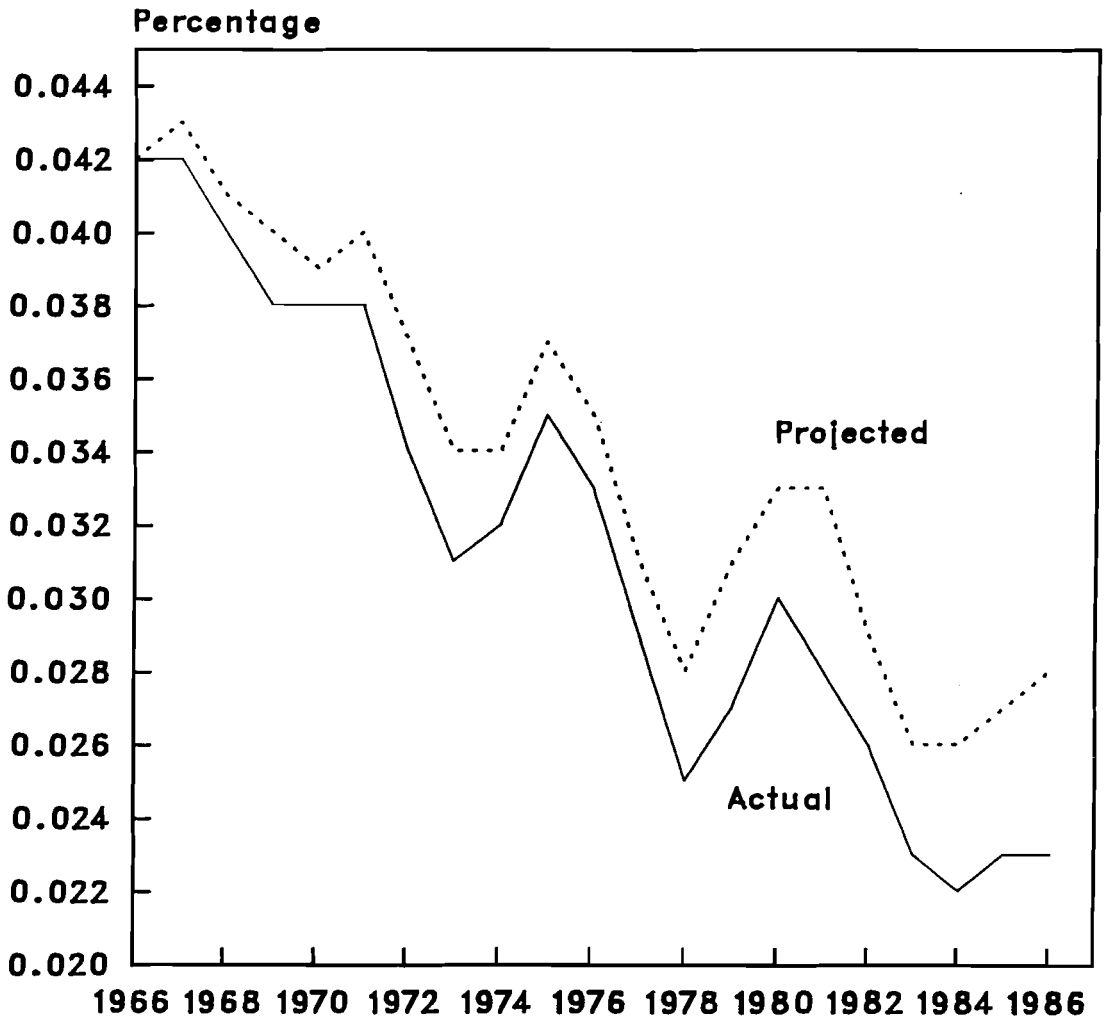
Source: U.S. Department of Commerce, Bureau of Economic Analysis; and Bureau of the Census, Government Finances.

Figure 4: Actual and Simulated Values for Total State and Local Public Welfare Expenditures as a Share of GSP



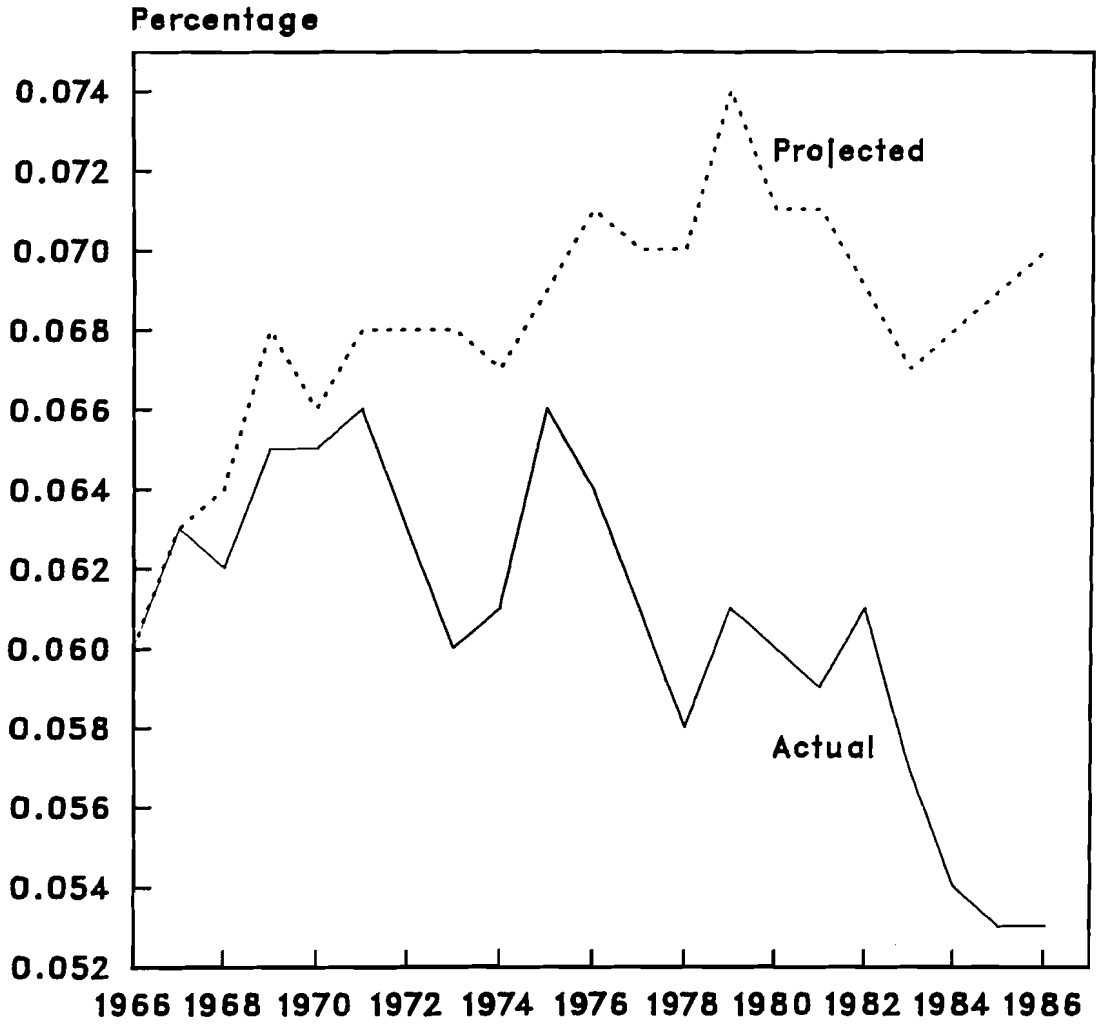
Source: U.S. Department of Commerce, Bureau of Economic Analysis; and Bureau of the Census, Government Finances.

Figure 5: Actual and Simulated Values for Total State and Local Capital Expenditures as a Share of GSP



Source: U.S. Department of Commerce, Bureau of Economic Analysis; and Bureau of the Census, Government Finances.

Figure 6: Actual and Simulated Values for Total State and Local Education Expenditures as a Share of GSP



Source: U.S. Department of Commerce, Bureau of Economic Analysis; and Bureau of the Census, Government Finances.

Table 1: Sample Statistics of Public- and Private-Sector Measures, 1964-1986

Variables	Mean	Standard Deviation	Minimum	Maximum
Government Share of GSP:				
Total	.158	.025	.010	.224
Capital outlays	.034	.001	.022	.076
Education	.062	.011	.037	.101
Protective services	.007	.002	.004	.011
Public welfare	.016	.005	.007	.031
Sectoral Shares of GSP:				
Agriculture and forestry	.047	.045	.007	.216
Mining	.067	.115	.001	.482
Construction	.081	.022	.056	.188
Manufacturing	.225	.096	.042	.395
TCPU	.103	.014	.077	.137
FIRE	.154	.026	.100	.209
Services	.144	.046	.065	.387

Source: U.S. Department of Commerce, Bureau of Economic Analysis; and Bureau of the Census, *Government Finances*.

Table 2: State Rankings of Government Shares and Per Capita GSP, Averaged over 1964-1986

State	Total	Capital Outlays	Educa-tion	Protec. Services	Public Welfare	Per Capita GSP
ALABAMA	17	14	19	25	16	48
ALASKA	1	1	16	22	45	1
ARIZONA	15	5	4	6	47	31
ARKANSAS	36	28	34	46	14	47
CALIFORNIA	22	36	30	8	4	8
COLORADO	26	20	13	19	20	17
CONNECTICUT	42	46	47	15	24	6
DELAWARE	19	11	10	33	40	11
FLORIDA	31	19	35	9	46	38
GEORGIA	27	17	33	28	22	42
HAWAII	2	3	17	7	11	30
IDAHO	25	26	27	26	37	37
ILLINOIS	44	47	46	14	19	7
INDIANA	47	49	32	41	44	20
IOWA	29	30	18	43	28	23
KANSAS	40	34	31	44	39	14
KENTUCKY	39	24	40	39	18	34
LOUISIANA	49	48	50	47	42	3
MAINE	10	33	24	17	5	46
MARYLAND	5	8	7	5	15	35
MASSACHUSETTS	21	39	42	3	3	19
MICHIGAN	24	44	21	13	7	13
MINNESOTA	11	18	12	36	9	18
MISSISSIPPI	12	15	22	35	12	49
MISSOURI	46	43	44	21	32	25
MONTANA	18	9	15	38	34	24
NEBRASKA	34	4	26	37	43	27
NEVADA	28	10	48	1	48	5
NEW HAMPSHIRE	33	31	36	20	21	32
NEW JERSEY	38	50	41	11	23	10
NEW MEXICO	30	29	14	30	38	15
NEW YORK	4	32	28	2	2	9
NORTH CAROLINA	41	37	29	32	41	41
NORTH DAKOTA	16	13	1	49	33	22
OHIO	43	45	43	23	27	16
OKLAHOMA	45	42	45	45	13	12
OREGON	8	21	5	10	26	29
PENNSYLVANIA	37	40	38	29	10	28
RHODE ISLAND	7	38	23	4	1	40
SOUTH CAROLINA	20	23	8	31	35	50
SOUTH DAKOTA	6	7	3	40	25	45
TENNESSEE	35	12	39	24	31	44
TEXAS	50	41	49	48	49	4
UTAH	9	6	2	27	29	39
VERMONT	3	16	6	34	6	36

Table 2: Continued

State	Total	Capital Outlays	Education	Protec. Services	Public Welfare	Per Capita GSP
VIRGINIA	23	22	20	18	36	43
WASHINGTON	14	2	11	16	17	21
WEST VIRGINIA	32	27	25	50	30	33
WISCONSIN	13	35	9	12	8	26
WYOMING	48	25	37	42	50	2

Source: U.S. Department of Commerce, Bureau of Economic Analysis; and Bureau of the Census, *Government Finances*.

Table 3: Shares of State GSP by Various State and Local Government Expenditure Categories, Averaged over 1964-1986

State	Total	Capital Outlays	Education	Protec. Services	Public Welfare	Per Capita GSP
ALABAMA	0.169	0.036	0.065	0.006	0.017	7,919
ALASKA	0.226	0.078	0.067	0.006	0.009	23,579
ARIZONA	0.170	0.048	0.075	0.010	0.008	9,716
ARKANSAS	0.144	0.031	0.056	0.004	0.017	8,317
CALIFORNIA	0.163	0.027	0.057	0.009	0.025	12,515
COLORADO	0.157	0.034	0.068	0.007	0.015	11,196
CONNECTICUT	0.133	0.023	0.047	0.007	0.015	12,748
DELAWARE	0.167	0.038	0.069	0.006	0.012	11,803
FLORIDA	0.151	0.035	0.056	0.009	0.009	9,312
GEORGIA	0.155	0.035	0.057	0.006	0.015	9,169
HAWAII	0.219	0.052	0.066	0.010	0.020	10,368
IDAHO	0.157	0.033	0.060	0.006	0.012	9,328
ILLINOIS	0.127	0.023	0.048	0.007	0.016	12,681
INDIANA	0.122	0.022	0.057	0.005	0.009	10,957
IOWA	0.154	0.030	0.066	0.005	0.014	10,808
KANSAS	0.138	0.029	0.057	0.005	0.012	11,469
KENTUCKY	0.141	0.033	0.053	0.005	0.016	9,620
LOUISIANA	0.105	0.022	0.036	0.004	0.011	15,400
MAINE	0.176	0.029	0.064	0.007	0.024	8,318
MARYLAND	0.190	0.041	0.073	0.010	0.017	9,397
MASSACHUSETTS	0.163	0.025	0.052	0.011	0.027	11,152
MICHIGAN	0.158	0.024	0.064	0.008	0.021	11,613
MINNESOTA	0.174	0.035	0.069	0.005	0.021	11,157
MISSISSIPPI	0.174	0.036	0.064	0.005	0.018	7,671
MISSOURI	0.126	0.025	0.049	0.007	0.013	10,588
MONTANA	0.169	0.040	0.067	0.005	0.012	10,706
NEBRASKA	0.147	0.048	0.061	0.005	0.011	10,526
NEVADA	0.154	0.038	0.047	0.011	0.008	13,379
NEW HAMPSHIRE	0.150	0.030	0.055	0.007	0.015	9,663
NEW JERSEY	0.143	0.021	0.052	0.009	0.015	11,861
NEW MEXICO	0.153	0.031	0.068	0.006	0.012	11,374
NEW YORK	0.192	0.030	0.060	0.011	0.028	12,413
NORTH CAROLINA	0.137	0.027	0.060	0.006	0.012	9,208
NORTH DAKOTA	0.170	0.037	0.099	0.004	0.012	10,879
OHIO	0.128	0.024	0.050	0.006	0.014	11,286
OKLAHOMA	0.126	0.025	0.049	0.005	0.018	11,709
OREGON	0.181	0.034	0.073	0.009	0.014	10,394
PENNSYLVANIA	0.144	0.025	0.054	0.006	0.020	10,479
RHODE ISLAND	0.185	0.026	0.064	0.010	0.029	9,268
SOUTH CAROLINA	0.166	0.034	0.072	0.006	0.012	7,415
SOUTH DAKOTA	0.188	0.045	0.076	0.005	0.015	8,796
TENNESSEE	0.146	0.037	0.053	0.006	0.013	8,918
TEXAS	0.099	0.025	0.042	0.004	0.008	13,818
UTAH	0.176	0.048	0.086	0.006	0.013	9,310
VERMONT	0.192	0.035	0.073	0.005	0.022	9,380

Table 3: Continued

State	Total	Capital Outlays	Education	Protec. Services	Public Welfare	Per Capita GSP
VIRGINIA	0.159	0.034	0.065	0.007	0.012	9,010
WASHINGTON	0.171	0.052	0.069	0.007	0.016	10,949
WEST VIRGINIA	0.150	0.032	0.061	0.004	0.013	9,629
WISCONSIN	0.172	0.029	0.070	0.008	0.021	10,545
WYOMING	0.116	0.033	0.054	0.005	0.006	21,432

Source: U.S. Department of Commerce, Bureau of Economic Analysis; and Bureau of the Census, *Government Finances*.

Table 4: Share of GSP Originating from Various Sectors, Averaged over 1964-1986

State	Agriculture & forestry	Mining	Construc-tion	Mfg.	TCPU	FIRE	Services
ALABAMA	0.036	0.036	0.072	0.285	0.109	0.134	0.134
ALASKA	0.019	0.339	0.187	0.050	0.093	0.112	0.096
ARIZONA	0.039	0.041	0.122	0.152	0.102	0.183	0.163
ARKANSAS	0.087	0.049	0.078	0.253	0.104	0.133	0.116
CALIFORNIA	0.031	0.028	0.072	0.211	0.090	0.190	0.182
COLORADO	0.040	0.063	0.096	0.148	0.113	0.179	0.161
CONNECTICUT	0.008	0.001	0.067	0.335	0.076	0.187	0.153
DELAWARE	0.023	0.002	0.088	0.355	0.098	0.145	0.132
FLORIDA	0.038	0.014	0.105	0.123	0.107	0.200	0.191
GEORGIA	0.034	0.006	0.077	0.248	0.119	0.146	0.140
HAWAII	0.043	0.000	0.126	0.073	0.126	0.209	0.210
IDAHO	0.130	0.017	0.084	0.170	0.114	0.155	0.141
ILLINOIS	0.027	0.016	0.066	0.282	0.106	0.162	0.147
INDIANA	0.038	0.009	0.068	0.379	0.100	0.132	0.107
IOWA	0.140	0.003	0.066	0.239	0.091	0.165	0.116
KANSAS	0.077	0.100	0.062	0.199	0.121	0.148	0.117
KENTUCKY	0.048	0.084	0.073	0.308	0.092	0.124	0.109
LOUISIANA	0.017	0.405	0.067	0.119	0.082	0.100	0.087
MAINE	0.041	0.000	0.082	0.265	0.108	0.157	0.145
MARYLAND	0.016	0.002	0.091	0.195	0.104	0.181	0.193
MASSACHUSETTS	0.007	0.000	0.067	0.272	0.088	0.175	0.199
MICHIGAN	0.016	0.010	0.058	0.395	0.081	0.141	0.129
MINNESOTA	0.070	0.017	0.073	0.227	0.105	0.170	0.139
MISSISSIPPI	0.068	0.081	0.077	0.256	0.090	0.127	0.116
MISSOURI	0.040	0.006	0.069	0.260	0.123	0.151	0.145
MONTANA	0.103	0.124	0.097	0.106	0.129	0.157	0.119
NEBRASKA	0.139	0.012	0.072	0.153	0.122	0.173	0.130
NEVADA	0.015	0.025	0.107	0.052	0.106	0.151	0.387
NEW HAMPSHIRE	0.013	0.001	0.092	0.300	0.081	0.178	0.157
NEW JERSEY	0.007	0.001	0.069	0.289	0.109	0.176	0.161
NEW MEXICO	0.031	0.330	0.078	0.055	0.100	0.128	0.133
NEW YORK	0.008	0.002	0.055	0.223	0.107	0.207	0.196
NORTH CAROLINA	0.045	0.002	0.067	0.366	0.094	0.123	0.118
NORTH DAKOTA	0.182	0.112	0.090	0.050	0.107	0.155	0.110
OHIO	0.018	0.014	0.062	0.369	0.100	0.137	0.129
OKLAHOMA	0.039	0.273	0.061	0.143	0.099	0.120	0.107
OREGON	0.046	0.002	0.076	0.246	0.116	0.171	0.145
PENNSYLVANIA	0.013	0.019	0.067	0.316	0.111	0.143	0.153
RHODE ISLAND	0.008	0.000	0.062	0.315	0.081	0.168	0.169
SOUTH CAROLINA	0.032	0.003	0.082	0.328	0.092	0.134	0.131
SOUTH DAKOTA	0.216	0.015	0.072	0.083	0.107	0.168	0.128
TENNESSEE	0.032	0.008	0.072	0.302	0.083	0.143	0.145
TEXAS	0.023	0.245	0.070	0.173	0.096	0.120	0.111
UTAH	0.026	0.085	0.085	0.187	0.127	0.156	0.137
VERMONT	0.050	0.005	0.088	0.253	0.091	0.171	0.164

Table 4: Continued

State	Agriculture & Forestry	Mining	Construc-tion	Mfg.	TCPU	FIRE	Services
VIRGINIA	0.022	0.022	0.090	0.240	0.115	0.163	0.159
WASHINGTON	0.044	0.002	0.089	0.236	0.095	0.165	0.147
WEST VIRGINIA	0.009	0.198	0.072	0.222	0.137	0.110	0.101
WISCONSIN	0.055	0.001	0.066	0.335	0.086	0.157	0.125
WYOMING	0.034	0.482	0.088	0.042	0.097	0.100	0.065

Source: U.S. Department of Commerce, Bureau of Economic Analysis; and Bureau of the Census, *Government Finances*.

Table 5: Average Annual Percentage Change in Government's Share of GSP, 1964-1986

State	Total	Capital Outlays	Education	Protec. Services	Public Welfare
ALABAMA	-0.0006	-0.0304	0.0031	0.0026	0.0034
ALASKA	-0.0084	-0.0409	-0.0239	0.0015	-0.0160
ARIZONA	-0.0041	-0.0098	-0.0102	0.0080	0.0087
ARKANSAS	-0.0039	-0.0252	0.0017	0.0058	0.0042
CALIFORNIA	-0.0072	-0.0460	-0.0167	0.0008	0.0091
COLORADO	-0.0072	-0.0273	-0.0174	0.0061	0.0099
CONNECTICUT	-0.0038	-0.0435	-0.0122	-0.0046	0.0113
DELAWARE	-0.0045	-0.0572	-0.0058	0.0051	0.0042
FLORIDA	-0.0054	-0.0227	-0.0078	0.0082	0.0066
GEORGIA	-0.0048	-0.0167	-0.0091	0.0002	0.0052
HAWAII	-0.0105	-0.0320	-0.0134	-0.0076	0.0158
IDAHO	-0.0033	-0.0229	-0.0029	-0.0075	0.0051
ILLINOIS	0.0070	-0.0215	-0.0002	0.0087	0.0137
INDIANA	0.0020	-0.0271	-0.0058	-0.0040	0.0147
IOWA	-0.0019	-0.0267	-0.0075	0.0051	0.0075
KANSAS	-0.0014	-0.0253	-0.0062	0.0108	0.0152
KENTUCKY	-0.0017	-0.0467	-0.0013	0.0048	0.0071
LOUISIANA	0.0100	-0.0184	0.0104	0.0219	0.0245
MAINE	-0.0028	-0.0399	-0.0041	-0.0093	0.0092
MARYLAND	0.0023	-0.0219	-0.0036	-0.0019	0.0152
MASSACHUSETTS	-0.0066	-0.0339	-0.0056	-0.0152	0.0098
MICHIGAN	0.0081	-0.0435	0.0002	0.0096	0.0144
MINNESOTA	-0.0020	-0.0300	-0.0126	0.0011	0.0074
MISSISSIPPI	-0.0025	-0.0425	-0.0017	0.0055	0.0047
MISSOURI	-0.0043	-0.0305	-0.0046	-0.0042	0.0104
MONTANA	0.0013	-0.0278	-0.0009	0.0042	0.0105
NEBRASKA	-0.0024	-0.0281	-0.0053	0.0027	0.0052
NEVADA	-0.0069	-0.0423	-0.0081	0.0073	0.0009
NEW HAMPSHIRE	-0.0203	-0.0595	-0.0177	-0.0150	-0.0000
NEW JERSEY	0.0064	-0.0145	0.0006	-0.0086	0.0113
NEW MEXICO	0.0083	-0.0142	0.0007	0.0245	0.0102
NEW YORK	0.0058	-0.0236	-0.0007	-0.0041	0.0052
NORTH CAROLINA	-0.0032	-0.0202	-0.0032	0.0007	0.0031
NORTH DAKOTA	-0.0072	-0.0423	-0.0065	0.0039	0.0130
OHIO	0.0066	-0.0289	0.0053	0.0106	0.0128
OKLAHOMA	-0.0001	-0.0226	0.0033	0.0157	0.0153
OREGON	-0.0001	-0.0386	-0.0082	0.0154	0.0095
PENNSYLVANIA	0.0048	-0.0335	0.0026	-0.0011	0.0173
RHODE ISLAND	0.0038	-0.0419	0.0019	-0.0016	0.0132
SOUTH CAROLINA	0.0018	-0.0048	0.0001	0.0020	0.0013
SOUTH DAKOTA	-0.0133	-0.0421	-0.0175	0.0008	0.0063
TENNESSEE	-0.0082	-0.0459	-0.0086	-0.0042	0.0062
TEXAS	0.0060	-0.0096	0.0073	0.0102	0.0183
UTAH	0.0031	-0.0041	-0.0043	0.0196	0.0117
VERMONT	-0.0060	-0.0459	-0.0019	0.0061	0.0002

Table 5: Continued

State	Total	Capital Outlays	Education	Protec. Services	Public Welfare
VIRGINIA	-0.0058	-0.0412	-0.0064	0.0031	0.0116
WASHINGTON	-0.0018	-0.0273	-0.0089	0.0060	0.0131
WEST VIRGINIA	0.0140	-0.0070	0.0159	0.0013	0.0163
WISCONSIN	-0.0007	-0.0400	-0.0030	-0.0019	0.0089
WYOMING	0.0215	0.0051	0.0270	0.0319	0.0095

Source: U.S. Department of Commerce, Bureau of Economic Analysis and Bureau of the Census, *Government Finances*.

Table 6: Effect of Per Capita GSP on Public-Sector Size

Variable	Total	Capital Outlays	Education	Protec. Services	Public Welfare
Per capita GSP	-.531	-.253	-.535	-.454	-.583
	(-13.57)	(-2.25)	(-11.71)	(-8.12)	(-5.84)
Manufacturing	-.602	-1.03	.014	1.49	-3.15
	(-2.89)	(-1.71)	(.05)	(4.69)	(-5.91)
Mining	.151	-1.09	.447	1.33	.208
	(.75)	-1.88)	(1.91)	(4.62)	(.41)
Agriculture and forestry	-.333	-2.81	.355	.681	-2.50
	(-1.26)	(-3.70)	(1.15)	(1.80)	(-3.71)
FIRE	.858	-1.22	1.54	2.27	.218
	(3.12)	(-1.54)	(4.77)	(5.77)	(.31)
Construction	-.608	.433	-.012	1.49	-3.22
	(-2.35)	(.58)	(-.04)	(4.03)	(-4.89)
TCPU	3.40	4.24	4.31	6.11	.321
	(8.40)	(3.65)	(9.12)	(10.56)	(.31)
R^2	.90	.80	.88	.93	.87

Note: All regressions include time and state dummy variables. The dependent variable and per capita GSP are expressed in natural logs. The joint null hypothesis that the time and state dummy variables are equal to zero is rejected at the .01 confidence level for all equations. Each regression has 1,150 observations.

Source: U.S. Department of Commerce, Bureau of Economic Analysis; and Bureau of the Census, *Government Finances*.

Table 7: Time-Series Estimates of the Effect of Per Capita GSP on Government-Sector Size, 1964-1986

	Expenditure Functions				
	Total	Capital Outlays	Education	Protec. Services	Public Welfare
Number of statistically significant coefficients (.05 level)	28	37	26	22	20
States with positive coefficients	WS		RI	AL	FL
	OH			AK	HI
	NE			CO	IN
				KY	KY
				MN	MN
				NE	NE
				OR	OR
				WS	WS
					ME
					MA
					MI
					OH
					RI
					TN
					TX

Note: The log of government expenditures per GSP was regressed on the log of GSP per capita and the percentage of GSP in the primary and manufacturing sectors.

Source: U.S. Department of Commerce, Bureau of Economic Analysis; and Bureau of the Census, *Government Finances*.

Table 8: Cross-Section Estimates of the Effect of Per Capita GSP on Government-Sector Size, 1964-1986

Signs of Coefficients on Per Capita GSP
(for those that are statistically significant at the .05 level)

	Expenditure Functions				
Year	Total	Capital Outlays	Education	Protec. Services	Public Welfare
1964	-.235		-.222		
1965	-.184		-.211		
1966	-.232		-.263		
1967	-.245		-.381		
1968	-.347		-.475		
1969	-.304		-.817		
1970	-.301		-.434	.256	-.659
1971			-.338	.425	-.565
1972				.541	-.554
1973				.442	-.650
1974			-.243		
1975	-.305	-.329	-.435		
1976	-.292		-.409		-.470
1977	-.239		-.342		
1978	-.232			.292	
1979	-.277			.698	
1980			-.354	.290	
1981			-.395	.329	
1982			-.574	.431	
1983			-.351	.466	
1984			-.341	.486	
1985			-.406	.447	
1986			-.411	.405	

Note: The log of government expenditures per GSP is regressed on the log of GSP per capita, the number of years since the state achieved statehood, population density, and the percentage of GSP in the primary and manufacturing sectors. The coefficient on age of state (years since statehood achieved) was statistically significant 52 times (out of 115) and was always negative, with a coefficient of around -.002. The coefficient on population density was statistically significant 37 times and positive in all cases but two. Population density was always statistically significant and positive for protective services.

Source: U.S. Department of Commerce, Bureau of Economic Analysis; and Bureau of the Census, *Government Finances*.

References

Bennet, James T., and Manuel H. Johnson (1980), The Political Economy of Federal Government Growth: 1959-1978, Center for Education and Free Enterprise, Texas A&M University, College Station, Texas.

Bird, Richard M. (1971), "Wagner's Law of Expanding State Activity," Public Finance, vol. 26, pp. 1-25.

Holtz-Eakin, Douglas, Whitney Newey, and Harvey Rosen (1987), "The Revenues-Expenditures Nexus: Evidence from Local Government Data," National Bureau of Economic Research Working Paper No. 2180.

Peltzman, Sam (1980), "The Growth of Government," Journal of Law and Economics, vol. 23, no. 2, October, pp. 209-287.

Ram, Rati (1987), "Wagner's Hypothesis in Time-Series and Cross-Section Perspectives: Evidence from 'Real' Data for 115 Countries," Review of Economics and Statistics, vol. 69, pp. 194-205.

Wallis, John Joseph, and Wallace E. Oates (1988), "Does Economic Sclerosis Set in with Age? An Empirical Study of the Olson Hypothesis," Kyklos, vol. 41, pp. 397-417.